TP5- Graphical representation in MATLAB

Objective: The objective of this practical work is to learn how to represent and analyze data graphically using graphic windows. We also learn how to build a graphical user interface using the MATLAB GUIDE.

Exercise 1: Represent the graphs of the following functions:

1. $f\colon [0, 2\pi] \to \mathbb{R},\ x \mapsto \sin(x) + \frac{1}{3}\sin(3x) + \frac{1}{5}\sin(5x) + \frac{1}{7}\sin(7x),$
2. $f\colon [-3, 3] \to \mathbb{R},\ x \mapsto \sqrt[3]{x^2|x-2|},$
3. $f\colon [10^{-2}, \pi] \to \mathbb{R},\ x \mapsto \sqrt{x}\sin(1/x).$

Exercise 2: Represent the graph of the function:

$$f\colon [1, 10] \to \mathbb{R}$$

$$x \mapsto \begin{cases} (\ln(x)+2)^2 & \text{si } \ln(x) - x + 2 \geq 0 \\ x^2 - 4x & \text{si } \ln(x) - x + 2 < 0. \end{cases}$$

Exercise 3: Represent the graph of the function:

$$f\colon [-3, 3] \to \mathbb{R}$$

$$x \mapsto (1+x)e^{-x^2+3x\cos(x)} - (1+x^4)^2\sin(x).$$

Exercise 4:

1.) Create, using the linspace function, a vector V of 120 points, with values between -13 and 13, then draw the graph of the function $2V^2 + 5$ as a function of V.

2.) Draw the curve corresponding to the function ( ):

$$y = 4\exp\left(-\frac{(x-5)^2}{2}\right) \text{ pour } 0 \leq x \leq 10$$

(We will start by creating a value table for x with a step of 0.01).

a) Annotate the axes by indicating the abscissa x in (cm) and the ordinate y in (u.a).

b) Write its legend on this curve.

c) The curve must be red and marked “star” size 3.

Exercise 5 :

Write a Matlab script which represents on the same graph, the functions sin(x), cos(x), $\sin^2(x)$, $\sin(x^2)$ in different colors.

Exercise 6:

Draw on the interval [−5,5] the function x2cosx in blue solid line and the function xcosx in red dotted line.